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10/614,366

07/07/2003

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#A27  
20400 VIA PAVISO  
CUPERTINO, CA 95014

06/11/2007

EXAMINER

DSOUZA, JOSEPH FRANCIS A

ART UNIT

PAPER NUMBER

2611

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/614,366

Applicant(s)

MIAO, GEORGE J.

Examiner

Adolf DSouza

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2007.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 24 - 46 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 24, 29 - 45 is/are rejected.  
7) ☒ Claim(s) 25 - 28, 46 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

***Response to Arguments***

1. Examiner has accepted changes made to the drawings, specification, abstract and claims in response to the objections made to these.
2. Applicant's arguments with respect to claims 1 - 23 have been considered but are moot in view of the new ground(s) of rejection.

Applicant cancelled claims 1 – 23 and introduced new claims 24 – 46. Therefore Applicant's arguments regarding claims 1 – 23 are considered moot.

***Claim Objections***

3. Claim 40 is objected to because of the following informalities:  
Block interleaver should be changed to block deinterleaver, since it is on the receiver side.  
Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.  
  
Claim 33 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements.

See MPEP § 2172.01. The omitted elements are: the frequency ranges of the low pass band, the transition bands, and stop bands. Omission of such frequency ranges also renders the claim indefinite since it is not clear over what part of the spectrum the masks apply.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 24, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Fattouche et al. (US RE37802) and Graham (US 5,412,352).

Regarding claim 24, Crochiere discloses a multichannel modulation communication transceiver (page 292, Fig. 7.3; page 299, Fig. 7.8, element "Synthesizer"; page 290, section 7.1 – page 300, end of section 7.2.1) and a digital low pass finite impulse response (FIR) shaping filter (page 299, Fig. 7.8 filters  $h(n)$ ).

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Crochiere does not disclose a UWB system and a spread spectrum system that uses PN sequences and that the low pass filter is coupled to a D/A converter.

In the same field of endeavor, however, Tewfik discloses a UWB communication transceiver (section II which describes the transmitter side, up to section A; section 1V – receiver side).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Tewfik, in the system of Crochiere because this would allow the multichannels synthesized by the low pass filter to be transmitted in the UWB range, as disclosed by Tewfik (page 2261, Equations 1 and 2).

In the same field of endeavor, however, Fattouche discloses a pseudorandom noise (PN) sequence look-up table coupled to a multichannel PN sequence mapping (Fig. 1, elements  $c(1) \dots C(N)$ ; column 3, line 64 – column 4, line 12; wherein the PN sequence lookup table coupled to the mapping is interpreted as the PN sequence source 16).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to apply the PN sequences of Fattouche on each channel in Fig. 7.8 of Crochiere and then use the low pass filters  $h(n)$  in Fig. 7.8 because this would allow the symbols in each channel to be spread and the spectrum to be shaped, thereby providing orthogonality on the channels and also advantages of spread spectrum e.g. robustness to narrowband interference, as is well known in the art.

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In the same field of endeavor, however, Graham discloses the digital low pass FIR shaping filter coupled to a digital-to-analog (D/A) converter (Fig. 4, digital FIR filters 82, 84 and D/A converter 98).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Graham, in the system of Crochiere because this would allow the digitally filtered signal to be converted to analog form, as is well known in the art.

Regarding claim 33, Crochiere discloses a digital FIR lowpass-shaping filter (page 258, section 6.1.2).

Crochiere does not disclose a filter with multiple transition bands and attenuation.

In the same field of endeavor, however, McClellan discloses a lowpass band with -41.4 dBm coupled to a first transition band at -51.8 dBm; said first transition band at -51.8 dBm coupled to a second transition band at -54.3 dBm; said second transition band at -54.3 dBm coupled to a third transition band at -76.8 dBm; and said third transition band at -76.8 dBm coupled to a stop band with -76.8 dBm (page 697; section I, 1<sup>st</sup> paragraph and last 3 lines; wherein the mask is interpreted as being one of the arbitrary filter specifications that can be designed using the Remez algorithm for FIR filter design, with the frequencies of the passband, transition band and stop band being a choice of the designer. One of ordinary skill in the art can easily choose the breakpoints in the

frequencies and the attenuations specified and then use Remez algorithm to generate the filter coefficients.).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by McClellan, in the system of Crochiere because this would allow any mask to be designed and filter coefficients generated using Remez algorithm.

7. Claims 29, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Fattouche et al. (US RE37802), Graham (US 5,412,352) and Hudson (US 20030043887).

Regarding claim 29, Crochiere discloses N multichannel signals (page 299, Fig. 7.8; wherein the N multichannel signals are the "k" multichannels).

Crochiere does not disclose M orthogonal spreading sequences.

In the same field of endeavor, however, Hudson discloses PN sequence look-up table produces M-orthogonal spreading sequence (page 15, paragraph 169).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Hudson, in the system of Crochiere because this would allow the symbols in each channel to be spread, thereby providing orthogonality on the channels and also advantages of spread spectrum e.g. robustness to narrowband interference, as is well known in the art.

Regarding claim 30, Crochiere discloses that the multichannels are orthogonal to each other (page 292, Fig. 7.3 (a); wherein the orthogonality is obtained since the channels occupy different regions of the spectra as is well known in the art).

Further since Hudson discloses M-orthogonal spreading sequences, further orthogonality is obtained by spreading the data in each channel by the orthogonal spreading codes.

8. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Fattouche et al. (US RE37802), Graham (US 5,412,352), Harrison (US 5,396,489) and Sklar (Digital Communications; 2001; Prentice Hall; pages 732 - 735).

Regarding claim 31, Crochiere does not disclose that N XOR units for doing the PN sequence operation and a switch.



In the same field of endeavor, however, Sklar discloses a set of XOR units (page 733, Fig. 12.9 (b), "product" of  $x(t)$  and  $g(t)$ ); page 734, Fig. 12.10, waveforms (a), (b) and (c); wherein, as can be seen from the waveforms, the XOR operation is performed on  $x(t)$  and  $g(t)$  to give  $x(t)g(t)$ .

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Sklar, in the system of Crochiere because this would allow the input symbols to be spread, as is well known in the art.

In the same field of endeavor, however, Harrison discloses a switch (Fig. 2, commutator shown at input that converts the input stream into multiple streams).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Harrison, in the system of Crochiere because this would allow the input signal to be split into multiple channels that can then be XORed with the PN sequence of Sklar. The function of a commutator to split the input stream into several streams is well known in the art.

9. Claims 32, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Fattouche et al. (US RE37802),

Graham (US 5,412,352), Harrison (US 5,396,489), Sklar (Digital Communications; 2001; Prentice Hall; pages 732 - 735) and Van Nee (US 6,175,550).

Regarding claim 32, Crochiere does not disclose that the data rate can be changed by shutting off some of the channels and a UWB system.

In the same field of endeavor, however, Van Nee discloses produce the scalability data rates with multi-carrier frequencies (column 3, lines 21 – 27; column 11, lines 23 - 28).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Van Nee, in the system of Crochiere because this would allow the data rate to be varied, as disclosed by Van Nee.

Claim 39 is similarly analyzed as limitations in claim 32.

10. Claims 34, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Graham (US 5,412,352) and Harrison (US 5,396,489).

Regarding claim 34, Crochiere discloses a multichannel modulation communication transceiver (page 292, Fig. 7.3; page 299, Fig. 7.8, element "Synthesizer"; page 290,

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section 7.1 – page 300, end of section 7.2.1) and a digital low pass finite impulse response (FIR) shaping filter (page 299, Fig. 7.8 filters  $h(n)$ ).

Crochiere does not disclose a UWB system and a spread spectrum system that uses a analog low pass filter, a mixer, a commutator unit, and a power amplifier.

In the same field of endeavor, however, Tewfik discloses a UWB communication transceiver (section II which describes the transmitter side, up to section A; section 1V – receiver side).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Tewfik, in the system of Crochiere because this would allow the multichannels synthesized by the low pass filter to be transmitted in the UWB range, as disclosed by Tewfik (page 2261, Equations 1 and 2).

In the same field of endeavor, however, Graham discloses an analog low pass filter, a mixer and N selectable multicarrier frequencies, followed by a power amplifier (PA) (Fig. 3, analog low pass filter 62, mixer 64, multicarrier frequencies selectable by the frequency synthesizer 66); and a clock control coupled to said digital low pass FIR shaping filter, said D/A converter, and said multichannel-based multicarrier modulation (Fig. 4, elements 2.304 MHz clock and 100 MHz clock; wherein the clock control is interpreted as being done by the 2.304 and 100 MHz clocks).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Graham, in the system of Crochiere because this would allow the digital signal to be converted to analog form and then unconverted and transmitted, as disclosed by Graham.

In the same field of endeavor, however, Harrison discloses a switch (Fig. 2, commutator).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the commutator as disclosed by Harrison, to select any one of multiple carrier frequencies, in the system of Crochiere because this would allow one of several frequencies to be selected, as is well known in the art.

Regarding claims 35 and 36, the commutator function is as analyzed in claim 34 above.

Regarding claim 37, Crochiere does not disclose producing multicarrier frequencies by controlling a switch.

In the same field of endeavor, Graham discloses multichannel control is used to control said switch to turn on or turn off multicarrier frequencies. (Fig. 2, element 72; column 3, lines 26 – 30; wherein the multicarrier frequency is obtained through the microprocessor).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the switch as disclosed by Graham, to turn on/off any one of the multicarrier frequencies by a switch as disclosed by Graham.

Regarding claim 38, Crochiere does not disclose selectable multicarrier frequencies can be programmed to control the multichannel.

In the same field of endeavor, Graham discloses that the said switch can be used to turn off the fourth, the fifth multichannel or both of the multichannels to avoid interference with Wireless Local Area Network (WLAN) 802.11a devices. (Fig. 2, element 72, 66; column 3, lines 21 – 30; wherein the fourth or fifth multicarrier frequencies are provided by the microprocessor 72).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the switch as disclosed by Graham, to turn on/off any one of the multicarrier frequencies by a switch as disclosed by Graham.

11. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Hudson (US 20030043887) and Claydon et al. (US 5,910,960).

Regarding claim 40, Crochiere discloses a multichannel modulation communication receiver (page 292, Fig. 7.3; page 299, Fig. 7.8, element "Synthesizer"; page 290, section 7.1 – page 300, end of section 7.2.1).

Crochiere does not disclose a UWB system and a spread spectrum system, and the basic building blocks of a receiver.

In the same field of endeavor, however, Tewfik discloses a UWB communication receiver (section 1V – receiver side).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Tewfik, in the system of Crochiere because this would allow the multichannels synthesized by the low pass filter to be transmitted in the UWB range, as disclosed by Tewfik (page 2261, Equations 1 and 2).

In the same field of endeavor, however, Hudson discloses a low noise amplifier (LNA (Fig. 1, element 134) a multichannel-based multicarrier down converter (Fig. 1, element 132); an analog-to-digital (A/D) converter (Fig. 1, element 138); a digital receiver low pass finite impulse response (FIR) filter (Fig. 1, element 140) a rake receiver; an equalizer (Fig. 1, element 142; paragraph 68); a despreading for pseudorandom noise (PN) sequence and demapping (Fig. 1, element 142; paragraph 68); a decoder (Fig. 1, element 144); a PN sequence look-up table coupled to the rake receiver and the despreading for PN sequence and demapping (claim 29) ; an channel estimator coupled

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to the rake receiver and the equalizer (paragraphs 2, 9); and the rake receiver; and a multichannel control connected to the multichannel-based multicarrier down converter, and the despreading for PN sequence and demapping (Fig. 1, element 132; paragraph 68; wherein the multichannel control is interpreted as selecting the appropriate frequency for down conversion).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the basic receiver blocks of Hudson, in the system of Crochiere because this would allow receiver functions to be implemented as disclosed by Hudson.

In the same field of endeavor, however, Claydon discloses a deinterleaver (Fig. 4, deinterleaver 69) and a synchronization and time control connected to the multichannel-based multicarrier down converter, the digital receiver low pass FIR filter (Fig. 4, timing recovery 62, carrier recovery 64, down converter 23, low pass filters 58 and Nyquist filter 63).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the basic receiver blocks of Claydon, in the system of Crochiere because this would allow receiver functions to be implemented as disclosed by Claydon.

12. Claim 41, 43, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Hudson (US 20030043887), Claydon et al. (US 5,910,960), Harrison (US 5,396,489) and Umeda (US 4,170,760) .

Regarding claim 41, Crochiere does not disclose a analog bandpass filter, down converter unit.

In the same field of endeavor, Umeda discloses a multichannel based multi-carrier down converter comprising: a analog bandpass filter; a down converter unit; a multichannel filter; and selectable multi-carrier frequencies (Fig. 1, elements 3, 4, 5, 6, 16; column 2, line 46 – column 3, line 7; wherein the analog bandpass filter is the RF amp, the down converter is the mixer 4, the multichannel filter is the IF amplifier and the selectable carrier frequencies are obtained from element 16).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the basic receiver blocks of Umeda, in the system of Crochiere because this would allow receiver functions to be implemented as disclosed by Umeda.

In the same field of endeavor, however, Harrison discloses a commutator unit (Fig. 2).



Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Harrison, in the system of Crochiere because this would allow a input signal, in this case a carrier frequency, to be selected, as is well know in the art.

Regarding claim 43, Crochiere does not disclose that there are N multicarrier frequencies.

In the same field of endeavor, however Umeda discloses selectable multicarrier frequency unit contains N multicarrier frequencies, where N is an integer (Fig. 1, elements 3, 4, 5, 6, 16; column 2, line 46 – column 3, line 7; wherein the multicarrier frequency is provided by element 16).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Umeda, in the system of Crochiere because this would allow one of the appropriate multicarrier frequencies to be selected for down conversion, as disclosed by Umeda.

Regarding claim 44, Crochiere does not disclose scalability.

In the same field of endeavor, however Umeda discloses the multichannel-based multicarrier down converter is programmable (Fig. 1, elements 3, 4, 5, 6, 16; column 2, line 46 – column 3, line 7; wherein the multicarrier frequency is provided by element 16).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Umeda, in the system of Crochiere because this would allow one of the appropriate multicarrier frequencies to be selected for down conversion, as disclosed by Umeda.

In the same field of endeavor, however, Van Nee discloses produce the scalability data rates with multi-carrier frequencies (column 3, lines 21 – 27; column 11, lines 23 - 28).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Van Nee, in the system of Crochiere because this would allow the data rate to be varied, as disclosed by Van Nee.

13. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Hudson (US 20030043887), Claydon et al. (US 5,910,960), Harrison (US 5,396,489), Umeda (US 4,170,760) and Van Nee (US 6,175,550).

Regarding claim 42, Crochiere does not disclose the down converter produces multibaseband UWB signals.

In the same field of endeavor, Umeda discloses the down converter produces the multi-baseband signals by using multi-carrier frequencies which is controlled by using a switch (Fig. 1, elements 3, 4, 5, 6, 16; column 2, line 46 – column 3, line 7; wherein the multicarrier frequency is provided by element 16).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Umeda, in the system of Crochiere because this would allow the appropriate multicarrier frequency to be selected for down conversion, as disclosed by Umeda.

14. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Hudson (US 20030043887), Claydon et al. (US 5,910,960), Umeda (US 4,170,760) and Van Nee (US 6,175,550).

Regarding claim 45, Crochiere does not disclose basic receiver functions.

In the same field of endeavor, Hudson discloses multichannel-based multicarrier downconverter (Fig. 1, element 132) coupled to said A/D converter (Fig. 1, element 138) followed by said digital receiver lowpass FIR filter (Fig. 1, element 140) that is connected to said rake receiver followed by said equalizer (Fig. 1, element 142) and said PN sequence look-up table (claim 29).

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Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Hudson, in the system of Crochiere because this would allow basic receiver functions to be implemented, as disclosed by Hudson.

***Allowable Subject Matter***

15. Claims 25 – 28, 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Other Prior Art Cited***

16. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

The following patents are cited to further show the state of the art with respect to multichannel systems and multistage filters:

Libove et al. (US 6433720) discloses use pulse generator for UWB systems.

Miller et al. (US 20030067963) discloses a mode controller for signal acquisition and tracking in an ultra wideband communication system.

McCorkle et al. (US 6505032) discloses carrier less ultra wideband wireless signals for conveying application data.

### ***Conclusion***

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adolf DSouza whose telephone number is 571-272-

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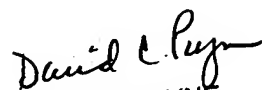
1043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
AD

Adolf DSouza  
Examiner  
Art Unit 2611

  
DAVID C. PAYNE  
SUPERVISORY PATENT EXAMINER